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I, LEANNE MYNOTT, MANAGER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2003904771 for a patent by CAMPBELL ROSS MCKINLAY and JULIAN MCKINLAY KING as filed on 03 September 2003.

WITNESS my hand this
Tenth day of September 2004

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Description

This invention relates to improvements in the manufacture and operating costs of insulated glass door structures.

While this invention is open to various modifications, certain illustrated embodiments thereof have been described and sketched below. It should be understood that there is no intention to limit the invention to the specific forms provided but on the contrary, the intention is to cover all alternative constructions and equivalents falling within the scope of the invention.

In some glass door structures, for example those in refrigerators, freezers, and the like, where a temperature differing substantially from that of the surrounding atmosphere is to be maintained within a storage compartment, an electrical current and metallic film is employed heating the outer glass pane in an effort to eliminate condensation and provide clear visibility to the goods contained.

Such conventional glass doors demand not only electrical heating themselves but due to heat transfer, require additional energy in order to maintain internal refrigeration.

In addition, conventional insulated glass doors comprise parallel panes of glass affixed with spacer bars to form one complete glass unit. This glass pane assembly is then enclosed within a metal or fibreglass structural door frame in order to complete the construction of the insulated glass door.

It is an object of his invention to:

1. provide a greatly improved insulated glass door,
2. to remove the need for heating of the insulated glass door in order to eliminate condensation, and thus reduce substantially both manufacturing and operating costs, and
3. reduce the number of manufactured components due to the design encompassing pane spacers and door frame in one plastic extruded unit.

This will become apparent from the detailed description below.

For a better understanding of the invention, reference may be made to the accompanying drawings where:

Figure 1 is a front view of the insulated glass door assembly attached to a refrigerator/freezer unit,

Figures 2a and 2b are cross sectional diagrams of possible plastic extrusions which act both as door frame as well as the glass an plastic pane spacers and mounts, and

Figure 3 is a cross sectional diagram of the invention comprising a complete insulated glass door with door frame, glass and plastic panes, hinge assembly mountings, desicant moisture absorption granules, argon gas, and gasket.

Unique to this particular invention is the use of a plastic extrusion (Fig 2a,b) forming both the door frame and pane mount and spacing assembly. This extruded plastic is cut and welded to suite the refrigeration unit. Glass panels (Fig 3, 1 and 3) are mounted on the mounting surfaces (4 and 6) while a clear rigid thermal plastic pane (2) is mounted midway between glass panes (5). Glass and plastic panes are attached to mounting surfaces using a rigid adhesive. Glass and plastic panes are spaced to provide optimum insulation with argon gas or air-filled cavities (7) inserted via latex valves located in the horizontal door frame members (8). Desicant chambers (9 and 10) formed in the plastic extrusion are filled with desicant moisture absorption granules in the vertical frame sections and sealed using plastic caps (11) prior to welding. A magnetised flexible gasket (12) is inserted into the gasket retaining groove (13) providing an airtight seal between the insulated glass door and the door facia of the refrigerator/freezer unit (18).

Additional features in the plastic extrusion include a hinge and torsion bar mounting point (14), screw boss for door a hold-open anchoring device (15), a screw boss for door handle mounting (16), and excess rigid adhesive traps (17).

From the foregoing, it can be seen that the insulated door assembly of the present invention has a modern substantially all glass front appearance but increasing the efficiency and strength of conventional insulated doors to which the industry has been accustomed. Since the door assembly requires fewer components such that it comprises a single unit, structural instability causing sag is eliminated, manufacturing costs are greatly reduced, and operational costs are substantially lowered with the removal of electrical heating.

Inventors

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3rd September, 2003

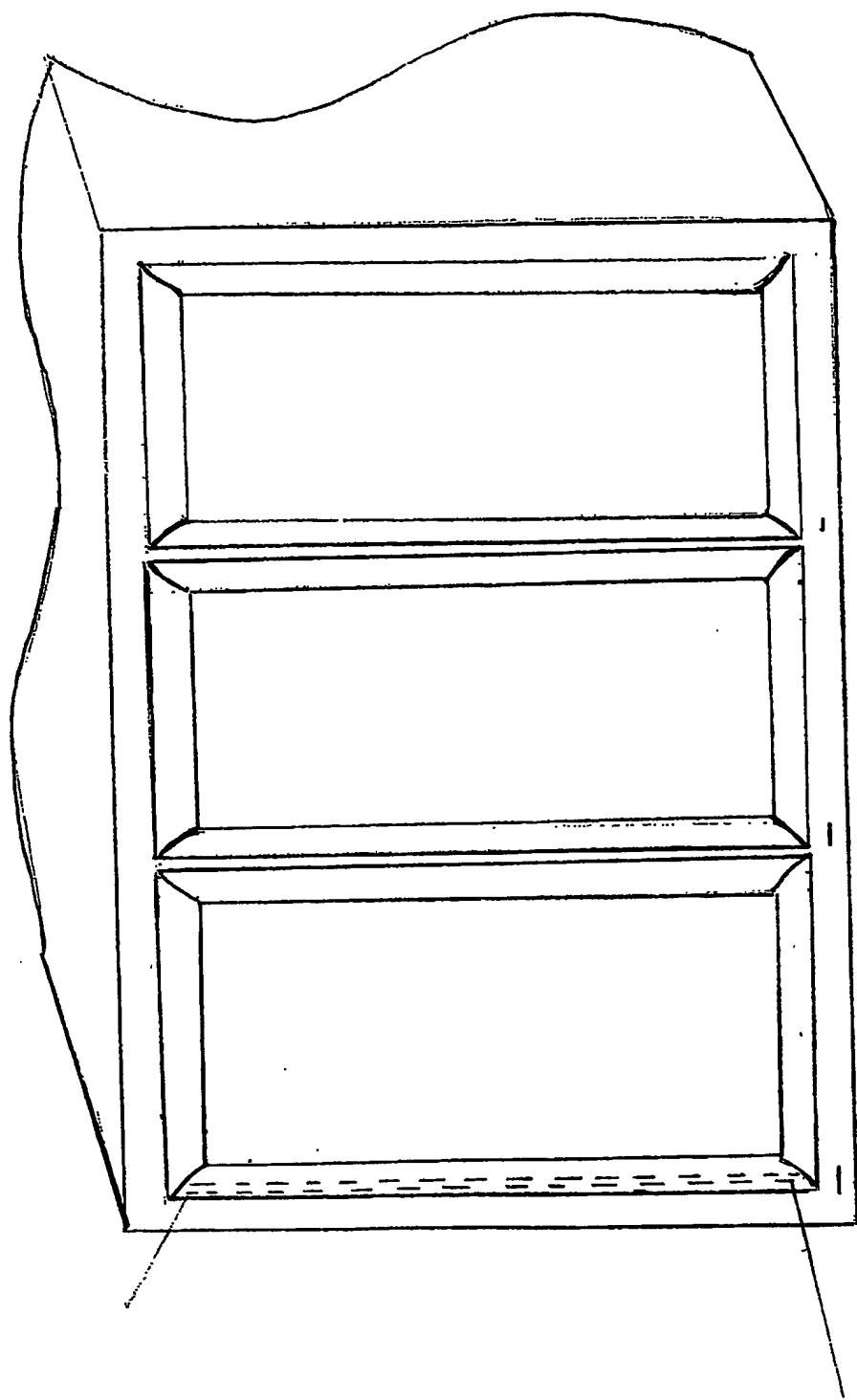


FIG 1

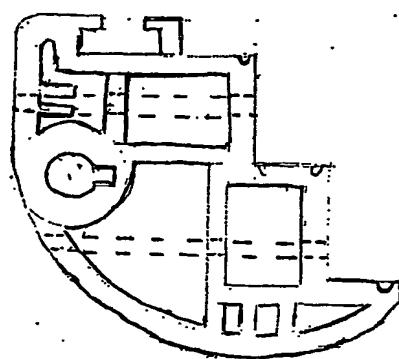


FIG 2A

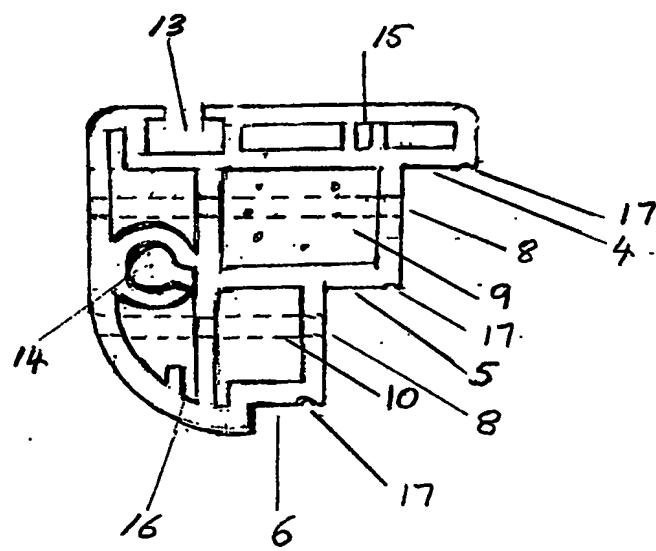


FIG 2B

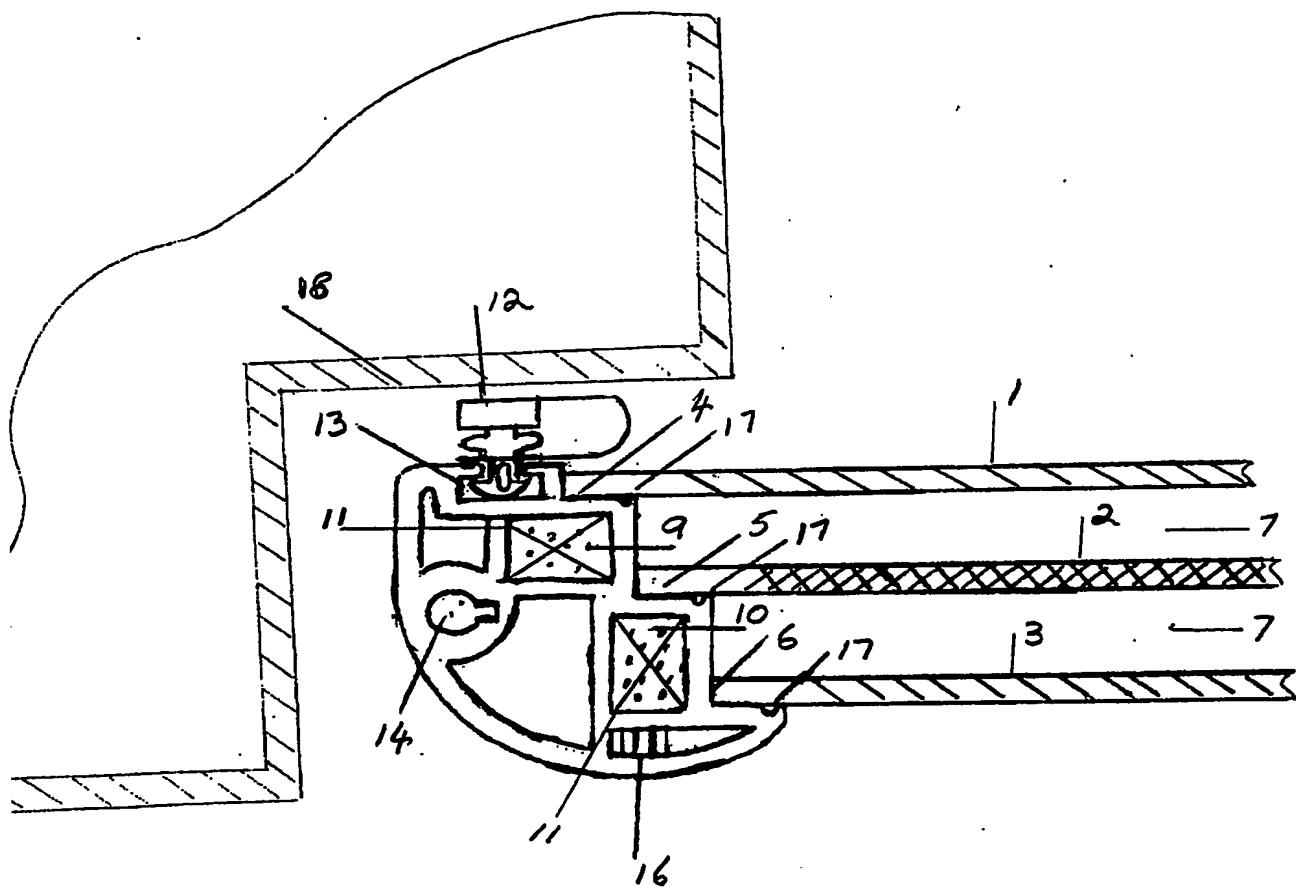


FIG 3